Colorado School of Mines engineers will test nuclear materials as part of a partnership between the Massachusetts Institute of Technology Reactor and INL's Advanced Test Reactor National Scientific User Facility.

Colorado School of Mines is preparing MIT reactor experiment under new partnership

by John Walsh, *INL Communications*

The ink was hardly dry on a partnership between the U.S. Department of Energy's Idaho National Laboratory User Facility and the Massachusetts Institute of Technology Reactor (MITR) to make test space available in the reactor when the agreement was put into action.

On July 17, the Colorado School of Mines nuclear materials irradiation experiment was the first selected to be put into the 5-megawatt MITR.

The Advanced Test Reactor National Scientific User Facility (ATR NSUF) at Idaho National Laboratory and the MITR announced the partnership July 8 to increase user access to national reactor irradiation and testing capability.

Prof. David Olson, Colorado School of Mines (Mines) Department of Metallurgy and Materials Engineering, said the partnership is "a tremendous advantage in allowing our students in the nuclear materials program to get hands-on experience with the tools and procedures involved with the nuclear industry."

The experiments will involve evaluating how silicon carbide specimens are affected by high-radiation environments found in nuclear reactor cores -- for instance, does the material physically or atomically change? The information gathered could provide the nuclear industry with advanced structural materials that can withstand extreme radiation, or new measurement and assessment instruments that can be used inside reactors.

After being irradiated, experiment samples will be handled and assessed at the Colorado School of Mines inside a controlled protected atmosphere box.

The experiment is being prepared by Mines principal investigators Olson and Prof. Brajendra Mishra. They expect to complete assembly of the experiment specimens by early fall and send them to MIT. The tests will be done in two parts. The total test time will be two to five weeks.

Depending on residual radiation levels of the specimens after the tests are completed, initial post-irradiation examination will be done at either MIT or the Colorado School of Mines.

ATR NSUF Scientific Director Todd Allen said the Mines' experiment was a fifth choice in the 2007 solicitation selection process out of 19 experiment proposals. Four experiments were announced in April to go into the ATR's four available experiment spaces. When the partnership agreement was announced, it allowed a fifth experiment to be selected later this year for testing using the MITR.

"This arrangement increases opportunities for reactor testing and provides the NSUF greater flexibility to respond to user needs," Allen said.

Dr. Lin-wen Hu, associate director, MIT Research, Development and Utilization, said discussions between INL and MIT to form the partnership began soon after the User Facility was announced in April 2007.

"The university's reactor can accommodate up to three in-core experiments simultaneously. We plan to offer (space for) two in-core experiments for NSUF in 2009," Hu said.

Visit the ATR National Scientific User Facility website.
Visit the MIT Nuclear Reactor Laboratory website.
Visit the School of Mines Dept. of Metallurgical & Materials Engineering.

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